

A Review of Instruments for Assessing Body Image in Preschoolers

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Abstract Society has produced many idealized and unattainable standards of beauty. These may be internalized by young children, increasing the risk of body dissatisfaction, which is the strongest predictor of eating disorders. Prompted by this concern, the aim of the present research was to identify and analyze the instruments that have been used to measure body perception and body dissatisfaction in preschoolers. To this end, we reviewed 18 articles published between 2005 and 2017 and retrieved from the PsycINFO and MEDLINE databases. Our results indicated that the instruments used to assess body image comprise silhouette scales, interviews and questionnaires. The results suggest that body dissatisfaction is higher when assessed with silhouette scales compared to questionnaires and interviews in preschoolers. When developing instruments to assess preschoolers' body image, it is important to take their cognitive development into account.

Keywords Body Image, Body Dissatisfaction, Body Perception, Preschoolers, Instruments, Literature Review

about their bodies. Body dissatisfaction has been observed in children aged between 4 and 7 [7, 8, 12-26]. In a recent review on the subject, Tatangelo et al. [27] found that the prevalence of body dissatisfaction in children aged under 6 years old ranged between 20% and 70%, depending on the assessment instrument employed. In fact, the term "normative discontent", which refers to the high prevalence among women that are dissatisfied with their bodies due to the pursuit of thinness [28], could also be applied to 5-year old children [16, 17].

The study of body dissatisfaction in preschoolers is important for various reasons. First, body dissatisfaction is the strongest predictor of eating disorders in adolescents [29]. Second, the age of onset of eating disorders is decreasing, developing in some cases before adolescence [30]. In fact, children aged five to 13 years present a high prevalence of early onset of eating disorders, associated with similar psychological symptoms to those of adults with eating disorders [31]. Third, body dissatisfaction and the desire for thinness could have a negative impact on the development of self-esteem [17]. Lastly, body dissatisfaction is associated with increased symptoms of depression in adolescents [11, 32].

It is therefore essential to determine whether preschool children present body image distortion and body dissatisfaction, and if this is a predictor of eating disorders or body dimorphic disorder at older ages [18]. However, this requires developing valid and reliable instruments for preschool children [33]. The young age of participants has hampered assessment of their body image, generating inconsistent ideas about when body dissatisfaction develops and the possible psychosocial consequences [7].

1. Introduction

Body image is a multifaceted construct that includes perceptions of appearance, feelings and thoughts about the body, and the effect of these on the body's functions and capabilities [1, 2]. Gardner [3] has distinguished two components of body image. The perceptual component refers to the mental representation of our own body and its characteristics. The attitudinal component refers to the feelings we have about our body image and physical appearance.

In many present-day societies, thinness is perceived as a synonym of beauty and attractiveness [4] and the concept of overweight is surrounded by many prejudices and stereotypes [5]. These ideals of beauty and stereotypes can be internalized by preschool children [5-9], arousing concerns [10, 11] and negative opinions and feelings [12-14]

2. Objective

Given the above, the main objective of this review was to provide a comprehensive overview of the instruments employed to assess body image in children aged between 3 and 6 years old.

3. Methods

3.1. Inclusion and Exclusion Criteria

Inclusion criteria were: a) published in English or Spanish; b) focused on assessment of the relationship between body image in preschoolers. Because our goal is to determine the instruments used to assess body image in preschool children, we have also included experimental studies that evaluate body image. In this line, Hayes and Tantleff-Dunn [12] used a scale and an interview to evaluate body image and the effects of media in body image, while Dittmar, Halliwell and Ive [34] assessed whether Barbies could be a possible cause of girls' body dissatisfaction; c) the mean age of the participants must have been between 3 and 6 years, unless data were analyzed and reported for an preschool-group within a large sample. In this case, the number of preschoolers must have been specified. For example, Li et al. [25] examined body image among 2402 children aged 3-6.

Exclusion criteria were: a) published before 2005; b) literature review; c) focused on assessment programs about body image; h) assessment of body image is not described.

3.2. Search Strategy

The key constructs selected in accordance with the research objectives were "body image", "body size estimation", "body dissatisfaction", "body size", "satisfaction with body image", "preschool child*", "child*" and "young child*". Different search strategies were used with the key words to collect the articles. Boolean search operators were used to specify the relations between the different constructs (e.g., ("body image" OR "body dissatisfaction") AND "preschool child"). Asterisks were also added to the required key concepts, so as to include in the results words with the same stem as the concept, but with different suffixes (e.g., *satisfaction, to include words such

as dissatisfaction, etc.).

3.3. Procedure

In order to select the articles, we read the title, keywords and the abstract of each article. Figure 1 shows an adaptation of PRIMA flow diagram [35] of search process. A total of 18 articles fulfilled our research objectives.

4. Results

4.1. Silhouette Scales for Assessing Body Perception and Body Dissatisfaction

Silhouette scales are often used to assess body satisfaction and perceived appearance in children [6, 10, 36]. Current and ideal body size are often assessed by asking the child which figure reflects his or her current size and the figure he or she would like to have [18].

Meanwhile, perceptions of body size are assessed by examining the differences between current body image and perceived image. A discrepancy close to 0 means that the child's perceived body size is appropriate, but if there is a significant discrepancy [3], this indicates a distorted body image or an inappropriate perception of it. Distortion can be positive (when the body is perceived to be larger than it actually is) or negative (when the body is perceived to be smaller than it actually is). The attitudinal component of body image is assessed by asking participants to adjust their current image to their idealized (or preferred) image. Again, the discrepancy between current image and idealized image is calculated, and a difference of 0 indicates body satisfaction whereas a difference between the two suggests body dissatisfaction [18]. These scales have also served as a means to measure other variables, such as ideals of beauty and prejudice against obesity in preschoolers.

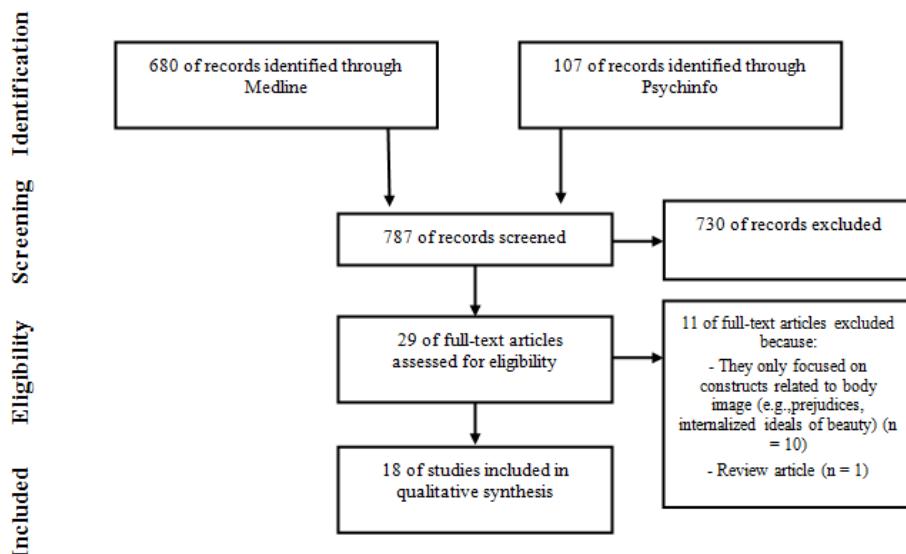


Figure 1. Review search process.

The Collins Figure Rating Scale [36], consisting of seven silhouettes ordered linearly from the smallest to largest body size, is a commonly used method to assess body perception and satisfaction in preschool children [4, 14, 34, 37]. In addition, the scale has been adapted by adding more figures [9, 23] or changing facial features [25]. Other silhouette scales that have been used besides the Collins Scale [36] include those developed by Tiggemann and Pennington [38],

Tiggemann and Wilson-Barret [39], Truby and Paxton [40] and Mciza, Goedecke, Steyn, Charlton and Puoane [41], or adaptations of the same [7, 20, 21, 42, 43], as well as scales designed and created specifically for the paediatric population [12, 19]. Table 1 shows the silhouette scales used in studies over the past 12 years in children aged 3 to 6 years old. Table 4 shows the main results obtained using the scales.

Table 1. Silhouette scales used to assess body image in preschoolers

Scale used to assess...	No. of silhouettes	Silhouettes arranged linearly from lowest to highest body mass index (BMI)	Characteristics	Validity of the scales	Number of participants, [mean age (SD, range)]	Author
Body perception	4	No (linear structure disrupted)	Scale adapted from the instrument <i>Body Image and Eating Questionnaire for Children</i> [41]. Scale also used to evaluate prejudices.	To check the validity of the scale, it was administered several times. Responses from 3-year-olds were inconsistent and were removed from the study.	30 girls and 30 boys [4.5 (3-5)]	Kean [7]
	7	Yes	Collins Scale [36].	Not described	11 girls and 6 boys [4.3 (.22), 4-5]	Burgess and Broome [37]
	7	Yes	Collins Scale [36]. Scale also used to evaluate prejudices.	Not described	69 children (61% girls) [5.0 (3.7-6.8)]	Holub [33]
	7	Yes	CBIS scale [40]. Scale also used to evaluate prejudices.	Not described	16 girls and 16 boys [5.1 (.45, 4.3-5.9)]	Meers et al. [43]
	7	Yes	Adaptation to schematic drawings of the CBIS scale [40]. Scale also used to evaluate prejudices.	Not described	32 girls and boys [5.1 (.45, 4.3-5.9)]	Meers et al. [43]
Body dissatisfaction	2	No.	Created for the study. This used software to superimpose participants' faces on the scale, thereby constructing a customized scale for each participant.	Not described	121 girls [4.44 (1.06), 3-6]	Hayes and Tantlef-Dunn [12]
	7	Yes	Collins Scale [36].	Not described	162 girls [5-8]	Dittmar et al. [34]
	7	Yes	Collins Scale [36] adapted for the Chinese population.	Not described. Because the scale of silhouettes correlated neither to BMI nor to weight, the authors suggested that the scale of silhouettes might not be a valid assessment of the body image perception of 3- and 4-year-old children.	1183 girls and 1219 boys (3-6)	Li et al. [25]
	9	Yes	The Children's Figure Rating Scale [39].	Not described	81 girls [5-8]	Dohnt and Tiggemann [15]
				Not described	128 girls [5-8]	Dohnt and Tiggemann [16]
				Not described	97 girls [5-8]	Dohnt and Tiggemann [17]

	5	Yes	Adaptation of the Tiggemann and Pennington scale [38]; The scale was created using colored felt fabric; Children could choose the hair color that closely matched their own. Scale also used to evaluate body size attitudes.	ICC analyzes showed a significant agreement between test (T1) and retest (T2) for current figure selection ($ICC = .58, p = .03$) and ideal figure selection ($ICC = .58, p = .03$) [44].	152 girls and 127 boys [4.49(4 years-old)]	Damiano, Gregg, Spiel, McLean, Wertheim and Paxton [20];
	3	Yes	Created for the study.	Research compared children's performance on 3 tasks (body part identification, animal stimulus, current body size perceptions and ideal body size). From 81% to 96% of the children completed the tasks without help from the experimenter.	111 girls [5.42 (.32, 5 years-old)]	Damiano et al. [21]
Body perception and body dissatisfaction	8	Yes	Adaptation of the Collins Scale [36].	Not described	68 girls and 76 boys [52 months (11 months), 3-5]	Tremblay et al. [19]
	9	Yes	Collins Scale [36] adapted by Rand and Resnick [45].	Not described	225 girls and 246 boys [4-6]	Makalesi et al. [23]
	9	No (each figure on a blank page)	Adapted from Tiggemann and Pennington [38].	Not described	296 boys and 278 girls [6.5 (.6), 5-7]	Pallan et al. [26]
				Not described	22 girls and 25 boys [4-6]	Birbeck and Drummond [42]

Table 2. Questionnaires to evaluate body image in preschoolers

Questionnaire used to assess...	Number of participants, [mean age (SD , range)]	Number of items	Characteristics	Validity of the instrument	Author
Body dissatisfaction	162 girls [5-8]	9	Adaptation of 9 items from the Revised Body-Esteem Scale questionnaire [46].	The questionnaire presented a good internal consistency coefficient ($\alpha = .71$) for all participants.	Dittmar et al.[34]
	128 girls [5-8] in Dohnt and Tiggemann [16] 97 girls [5-8] in Dohnt and Tiggemann [17]	2	Based on the format of the <i>Pictorial Scale of Perceived Competence/Social Acceptance</i> employed by Harter and Pike [47] with preschoolers, the authors developed a pictorial scale to assess satisfaction with appearance in girls. To introduce the girls to the task, they were first shown two images. One image depicted a girl who was happy with the way she looked at that moment while the other showed a girl who was not happy with the way she looked at that moment. Then, the girls had to select the girl who most closely resembled them, and finally they were asked a question about whether they felt happy with their appearance. The responses are scored on a Likert scale from 1 to 4 (1= always not happy, 2 = usually not happy, 3 = usually happy, 4 = always happy).	Not described	Dohnt and Tiggemann [16, 17]

4.2. Questionnaires to Assess Body Image

Only two studies have used questionnaires to evaluate body image (see Table 2). The main results obtained through questionnaires are found in Table 4.

4.3. Qualitative Research and Body Image

There are only 4 articles analyzing body image from a qualitative perspective (see Table 3).

Table 3. Body image evaluated from a qualitative perspective

Assessment of...	Number of participants, [mean age (SD, range)]	Method	Description	Results	Author
Body perception	22 girls and 25 boys [4-6]	Interview	The aim of the interview was to explore how children perceived their own body image and that of others, and to explore different concepts related to health.	- In girls, the notion of thinness as a desirable physical trait was prevalent. - In boys, the ideal was for a larger physique. Maybe, because they identified that a larger body size provides them with a practical advantage.	Birbeck and Drummond [42]
Body dissatisfaction	151 girls [5.91 (.86, 5-7)]	Interview	Adaptation of the <i>Body Part Satisfaction Scale</i> instrument, which has been widely validated in adult women and adolescent girls. In the interview, the girls were stood in front of a mirror and asked whether they liked or did not like different parts of their body. Body satisfaction was calculated using the number of positive comments that participants made about their body during the individual mirror exercise. Body dissatisfaction was calculated using the number of negative comments. The instrument has been validated in children aged 5 to 7 years old, but the study has not yet been published [48].	- Mean of positive comments about body (body satisfaction) = 6.23 ($SD = 2.87$). - Mean of negative comments about body (body dissatisfaction) = 1.59 ($SD = 1.94$).	Pérez et al. [14]
	121 girls [4.44 (1.06), 3-6]	Interview	Explore about children appearance satisfaction. Children were shown a visual scale with 3 response options (never or almost never, sometimes, and nearly all the time) in order to facilitate the activity.	- All but three participants liked the way they looked. - 24.8% of participants indicated that they disliked something about their physical appearance (e.g., hair, skin color, and body part). - 30.6% of girls noted that they would change something about their physical appearance.	Hayes and Tantlef-Dunn [12]
	29 girls and 24 boys [4 years]	Observation	Interviewers observed children in a play room for four hours. The research assistants checked off the children's behaviors and comments regarding bodies, food or clothing.	Although four-year-old girls express concerns about weight and boys about muscles, these concerns do not appear to impact on their general level of happiness.	McCabe et al. [13]

Table 4. Main results of studies that have evaluated body image with scales and questionnaires

Results about	Related to		Results	Author
Body perception	Do children perceive their body image accurately?	Inaccurate perception of their body size	The majority of children selected figures that were thinner than their current BMI with both photographic scales (64.3%) and line-drawn scales (71.4%).	Meers et al. [43]
			Only 58.8% chose the body shape that accurately estimated their current BMI.	Burgess and Broome [37]
		Differences in accordance with BMI	There was a higher prevalence of overweight children (85%) who inadequately perceived the size of their bodies compared to normal weight children (58%).	Tremblay et al. [19]
	Weight status	Correlations	Current self-perceived body size in girls and boys above 4 years old (the correlation coefficients ranged from .14 to .36) correlated with weight status.	Li et al. [25]
		Not correlations	The correlation between weight status and perceived body size was not significant.	Holub [33]
		Gender differences	In girls (but not in boys), there were positive associations between weight status and self- perception image size.	Pallan et al. [26]
	BMI	Correlations	Lower BMI was significantly associated with thinner "self" image size perception.	Pallan et al. [26]
			Current self-perceived body size in boys and girls above 5 years old (the correlation coefficients ranged from .22 to .41) was positive correlated to BMI.	Li et al. [25]
		Not correlations	The perceived body image was not correlated to current BMI when using the photographic scale or line-drawn scale.	Meers et al. [43]
	Ideal body image	Differences between perceived body size and ideal body size	The ideal body size was lower than that for perceived image size.	Pallan et al. [26]
			The mean perceived body size was significantly smaller than the ideal figure selection.	Damiano et al. [20]
		Gender differences	Girls had a lower median score than boys.	Pallan et al. [26]
		Weight status	BMI was significantly and positively associated with thinner ideal self-perception scores.	Pallan et al. [26]
	Anti-fat attitudes		Children who perceived themselves as heavier rated the overweight figure more positively.	Holub [33]
			Perception of a thinner body was associated with more anti-fat attitudes than perception of a large body size.	Holub [33]
Body dissatisfaction	Prevalence	With scales	55% of the children wanted to look like a figure different from their own (25% wanted to look thicker and 30% wanted to look thinner).	Kean [7]
			27.8% of boys wished to be a different body size (of which 22.9% wanted to look thinner and 77.1% wanted to be larger). Of girls, 37.7% wished to be a different size (of which 35.1% wanted to be thinner and 64.9% wanted to have a larger body).	Damiano et al. [20]
			28.8% of girls were dissatisfied with their body size (15.3% wanted to be thinner, and 13.5% wanted to be larger).	Damiano et al. [21]
			82% were dissatisfied with their body size.	Pallan et al. [26]
			49.6% of the girls wanted to have a thinner body.	Dohnt and Tiggemann [15]
			42% of the girls wanted to have a thinner body.	Dohnt and Tiggemann [16]
		With questionnaire (*)	(*) 45% of the girls were 'always' happy with their appearance, and 48% were 'usually' happy with the way they looked. No girl reported being 'always' unhappy with the way they looked.	Dohnt and Tiggemann [16]
	Body esteem	Correlations	Body shape discrepancies were significantly related to overall body esteem.	Dittmar et al. [34]

	Self-esteem	Desire for thinness	Body dissatisfaction was not significantly related to self-esteem.	Dohnt and Tiggemann [16]
			The desire for thinness was significantly associated with self-esteem evaluated one year later ($r = -.24, p < .05$).	Dohnt and Tiggemann [17]
			The desire for thinness significantly predicted decrease in self-esteem evaluated one year later.	Dohnt and Tiggemann [17]
	Peer's body dissatisfaction	Appearance satisfaction (a affective measure of body image assessed by questionnaire) (*)	(*) The relationship between appearance satisfaction and self-esteem was significant ($r = .48, p < .01$).	Dohnt and Tiggemann [16]
			(*) Appearance satisfaction correlated with self-esteem evaluated one year later ($r = .21, p < .05$).	Dohnt and Tiggemann [17]
			(*) Appearance satisfaction did not significantly predict change in self-esteem evaluated one year later.	Dohnt and Tiggemann [17]
		Correlations	Girl' perceptions of their peers' body dissatisfaction was positively related to their own level of body dissatisfaction ($r = .39, p < .01$).	Dohnt and Tiggemann [15]
		Possible predictor variable	Both BMI and girl' perceptions of their peers' body dissatisfaction predicted 29.9% of variance in body dissatisfaction.	Dohnt and Tiggemann [15]
			Both BMI and girl' perceptions of their peers' body dissatisfaction predicted 23% of variance in body dissatisfaction.	Dohnt and Tiggemann [16]
	Scales and questionnair e to assess body image	Not correlations	The relationship between body dissatisfaction (evaluated by scales) and appearance satisfaction (evaluated with questionnaire) was not significant.	Dohnt and Tiggemann [16]
	Weight status	Positive correlations	Body dissatisfaction scores were significantly related to weight status in both boys above 5 years old (the correlation coefficients ranged from .18 to .33) and girls above 3 years old (the correlation coefficients ranged from .14 to .28).	Li et al. [25]
			Body satisfaction was significantly associated with weight status in girls.	Tremblay et al. [19]
		No associations	There is no association between body dissatisfaction and weight status in boys.	Tremblay et al. [19]
	BMI	Positive associations	Body dissatisfaction score was positively associated with BMI.	Pallan et al. [26] Dohnt and Tiggemann [15]
			Body dissatisfaction scores were significantly related to BMI in both boys and girls aged over 5 years (the correlation coefficients ranged from .14 to .33).	Li et al. [25]
	Dieting awareness	Dieting awareness	Body dissatisfaction score was positively associated with dieting awareness ($r = .22, p < .05$).	Dohnt and Tiggemann [15]
		Dietary restraint	Body dissatisfaction was not associated with dietary restraint.	Damiano et al. [21]
	Age	Correlations	Body dissatisfaction score was positively associated with age.	Pallan et al. [26]
				Dittmar et al. [34] Dohnt and Tiggemann [15]
	Gender differences	Gender differences	Girls manifested greater body dissatisfaction than boys.	Tremblay et al. [19]
		No gender differences	There were no gender differences.	Pallan et al. [26]

Note. The results marked with asterisk (*) have been evaluated with questionnaires. The results without asterisks have been evaluated with scales of silhouettes

5. Discussion

The aim of the present study was to examine the methodology employed to assess body image in preschoolers. We identified a wide variety of instruments and techniques used to assess body image in preschoolers, including silhouette scales, interviews and questionnaires.

5.1. Body Image Assessment

5.1.1. Silhouette Scales

Through the evaluation of body image with scales of silhouettes, it has been observed that between 27.8% [20] to 82% [26] of preschool children would like to have a different body size from the current one. Silhouette scales ordered from low to high BMI are the most frequently employed method. Some authors [42, 49] have suggested the need to disrupt the linear structure of silhouette scales from low to high BMI, and instead put each figure on a separate sheet, because this might increase preschoolers' accuracy.

The scales have been constructed with drawn figures [19,

36, 38, 39, 41, 43] and with photographs [12, 40]. Some authors [12, 43] suggested that photographic scales could have advantages in the assessment of body image in preschoolers. In this line, personalized scales may facilitate children's immersion in the task and their identification with the figure [12]. Similarly, Meers et al. [43] found that children show greater prejudice when presented with a drawn silhouette scale as opposed to photographed silhouettes. Therefore, Meers et al. [43] concluded that drawn silhouette scales might induce children to give more stereotyped responses due to confounding factors caused by reduced realism.

Although scales comprise the most commonly used instruments, there is little literature on their psychometric properties in preschool children [33]. Paxton, Spiel, Damiano, and Yager [44] found a significant agreement between T1 and T2 when selecting current figure and ideal figure. In this line, Tremblay et al. [19] observed that more than 90% of the children needed no help in the tasks. However, Li et al. [25] found no relationships between BMI and body image in the youngest participants, and Holub [33] found very low correlations between perceived and current body image, suggesting that linearly ordered silhouettes may not be a valid means to assess preschoolers' perceived body image [33]. Kean [7] decided to eliminate the younger participants from the study because of the inconsistency of their answers when administering the scales several times. In the same vein, Collins [36] has suggested that this instrument might be less valid with young children. In short, the scant literature on the validity of the scales and the discrepancy of the results reflect the need for further research.

The use of silhouette scales with preschoolers has some limitations. For example, Gardner et al. [6] have stressed that this method might not necessarily reflect participants' perceptions, since the technique obliges them to suppress their latent responses and select a solution from the scale. Furthermore, Dunphy-Lelii, Hooley, McGivern, Guha and Skouteris [49] have indicated that if the same scale is used to select current image followed by ideal image, the former may influence selection of the latter, and children may also have difficulty in making comparisons with a hypothetical ideal. However, these scales also offer advantages: they are not intrusive for children, and can provide valid results when carefully and appropriately constructed [18].

5.1.2. Interviews and Questionnaires

Interviews might be an appropriate methodology to help gain greater insight into, and understanding of, children's experiences of their bodies [42, 50]. Thus, Birbeck and Drummond [42] observed that some thin/average build children rejected the overweight silhouette because they associated it with receiving physical abuse and not being able to defend oneself. In conclusion, the results of qualitative research reflect that children were generally satisfied with their appearance [12-14].

Self-report questionnaires represent another method for

assessing body dissatisfaction [e.g., 34]. In contrast to silhouettes scales, questionnaires have revealed a high rate of satisfaction with appearance. Tatangelo et al. [27] have advised that questionnaires for preschoolers should reflect children's attention span and involve tasks that do not last too long for very young children. In addition, it is essential to use simple vocabulary to facilitate understanding of the tasks [27].

Interestingly, no correlations have been found in this age range between body satisfaction as assessed by silhouette scales and appearance satisfaction assessed by questionnaires [16, 17]. Furthermore, Dittmar et al. [34] did not find correlations between the discrepancy between the ideal and current body (assessed by scales) and satisfaction with their appearance (assessed by questionnaire). These results suggest that the desire for thinness (assessed by scales) represents a cognitive construct that does not yet have affective consequences [16]. In other words, even when preschool girls' ideal body is thinner, they are not yet emotionally dissatisfied with their current appearance [16]. These results are in line with the findings obtained through qualitative research, in which it is observed that although four-year-old girls express some worries about the body, these concerns do not appear to impact on their general level of happiness [13]. Hence, further longitudinal research is required in order to determine the age range in which the desire for thinness might begin to be associated with the affective dimension in children.

5.2. Body Image and Relationships with BMI, Self-esteem, Peer's Body Dissatisfaction and Dieting in Preschoolers

The need for greater research into the body image of preschool children is reinforced by the results found in the studies: First, some investigations had found that BMI and weight status were correlated to body perception [25, 26] and body dissatisfaction [15, 19, 25, 26], suggesting that preschoolers may be aware of their weight and of the canons of beauty existing in society [26]. Second, positive correlations have been found between satisfaction with appearance and self-esteem in girls aged 5 to 8 years old [16] and between body dissatisfaction assessed by scales and overall body esteem [34]. In fact, the desire for thinness in girls aged between 5 and 8 years old can predict reduced self-esteem one year later [17]. These results suggest that body dissatisfaction and self-esteem are not only associated during adolescence [e.g., 32] but body dissatisfaction may also have a negative impact on young children's developing self-esteem [17]. Third, children's body dissatisfaction was associated with perceptions of their peers' body dissatisfaction [15, 16], suggesting that peers may be significant sources of influence on body satisfaction not only in early adolescence [e.g., 51, 52] and adolescence [e.g., 53], but also in preschoolers [15, 16]. Fourth, only three studies have analyzed the relationships between body dissatisfaction

and diet in preschool children. These studies have found that although body dissatisfaction was not associated with dietary restraint [21] it is associated with dieting awareness in infants [15]. Indeed, 43% of children reported that they would use some form of dietary restraint if their weight increased significantly [16]. All these results suggest the need to develop body image programs in pre-school children [7, 18, 33] in order to prevent the onset of body dissatisfaction, unhealthy eating disordered behaviors and decrease self-esteem.

5.3. Body Image and Cognitive Development

In order to perform a sensitive, suitable assessment in preschool children, their cognitive development should be taken into account [5, 49]. Dunphy-Lelii et al. [49] noted that assessing body image can be difficult due to differences in the children's development in terms of their ability to perceive their current size accurately and make comparisons with a hypothetical ideal. In this line, some studies have found that more than half of the participants do not adequately perceive their body size [19, 37, 43]. Thus, in a study of children aged 3 to 5 years old, Kean [7] decided to exclude the results on 3-year old children from data analysis because of the inconsistency of their responses over time, suggesting that children under 3 years old have probably not yet developed a body image. Li et al. [25] also eliminated the results for children aged 3 and 4 years old because after analyzing the results, there were no associations between BMI and current body size. However, Tremblay et al. [19] found that most children perform well in different training tasks about identifying or estimating their body size and suggested that cognitive skills' training is appropriate during this period of development. Due to discrepancies in results, as Dunphy-Leli et al. [49] have observed, it is therefore necessary to pool the literature on body dissatisfaction and self-representation in preschool children, and identify when and how preschoolers understand their body size and shape.

As regards future areas of research, further studies are required to identify the psychometric properties of the scales and questionnaires employed, in order to gain a deeper, more reliable insight into body dissatisfaction and body perception in preschool children. In addition, there is a need for longitudinal studies of the relationship between body dissatisfaction in preschool and primary school children as assessed by scales and questionnaires, in order to identify the age range in which the desire for thinness (assessed by scales) could have affective consequences for children (such as reduced body satisfaction).

6. Conclusions

The most commonly used instruments to assess body image are silhouette scales, interviews and questionnaires. As indicated by Tantagelo et al. [27], the prevalence of body

dissatisfaction varies markedly depending on the method used (scales, questionnaires or interviews). When body dissatisfaction is assessed by questionnaire or interview, children report being more satisfied with the way they look. One reason for the difference in the prevalence of body dissatisfaction depending on the instrument used (scale, questionnaire or interview) might be that the desire for thinness in preschoolers represents a cognitive construct that may not yet have affective consequences [16]. Regardless of the method for assessing body dissatisfaction, studies show that preschool children worry about their bodies. These results suggest the need to evaluate body image in children, since the use of body image programs at this age could prevent the development of eating disordered behaviors [13]. Lastly, it is necessary to consider preschoolers' cognitive development when developing instruments to assess their body image.

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